

PULSED SPECTROSCOPY WITH SPATIALLY VARIABLE  
POLARIZATION MODULATION ELEMENT

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ABSTRACT

A metrology device, such as an ellipsometer, includes a light source that produces a pulsed electromagnetic beam, such as a flash bulb or pulsed laser, and a spatially dependent polarizing element that introduces a spatially dependent retardation in the light beam. The use of a pulsed light source is advantageous over a continuous light source, as a pulsed light source generates less heat, is stronger, lasts longer, and does not need the use of a mechanical shutter. The use of a spatially dependent polarizing element advantageously eliminates the use of temporally dependent moving polarization modulation elements, thereby allowing the use of a pulsed light source. Downstream of the spatially dependent polarizing element are the analyzer and a multi-element detector that may be synchronized with the pulsed electromagnetic beam to detect after one or several pulses of light have been emitted from the pulsed light source.